## GENE EXPRESSION OF CHICKEN CELLS INFLUENCED BY PLASMIDLESS NON-MOTILE MUTANTS OF *SALMONELLA* ENTERITIDIS

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*Salmonella* Enteritidis is still a significant pathogen of human gastroenteritis, originating mainly from poultry (ECDC/EFSA supporting publication 2014). Recently we have shown that chicken embryo fibroblast cells (CEFs) proved to be useful for *in vitro* assessment of the innate immune response of chicks to *S.* Enteritidis infection. Therefore we intended to use CEFs to estimate and the significance of certain virulence determinants of *S.* Enteritidis in chicken. Our objective was to characterize the gene expression profiles of CEFs as a response to non-motile mutants of *S.* Enteritidis 11 (SE 11) lacking the serovar-specific virulence plasmid and/or the *fliD* gene in comparison to the wild type parental strain. Freshly isolated CEFs incubated with *Salmonella* for 4 hrs were used to measure the invasiveness of parental strain SE 11 and its virulence-defective mutants. We used Agilent custom 8×15K microarray to profile the expression of CEFs, with emphasis to genes related to the immune response. Expression of chicken genes identified as significantly up- or downregulated (≥3-fold) was verified by real-time PCR. Invasiveness of both mutants of SE11 proved to be significantly lower than that of parental strain. Infection with SE 11 induced 26 genes and led to the suppression of 39 genes. Out of them the colony-stimulating factor gene CSF3 and cytokine genes for IL-1β and IL-8 showed the highest upregulations. In contrast, infection with non-motile mutants lacking the virulence plasmid and/or *fliD* did not cause any significant change in host gene expression. However real-time PCR results indicated that the cell cycle G0S2 switch gene (cell division), and the enolase ENO2 gene (metabolism) were highly induced by the mutant strains, indicating that the reduced invasiveness of the mutants was concomitant to stimulated cell division and/or metabolism of the host cells. Based on these results *fliD* seems to be more important for the invasiveness of *Salmonella* Enteritidis than the serovar-specific virulence plasmid. This is in harmony with our earlier *in vivo* studies about minor significance of the virulence plasmid in the pathogenicity of S. Enteritidis 11.
In contrast, *fliD* could be considered as a modulator of the chicken response to *Salmonella* infection. Interestingly stimulation of non-immune genes such as G0S2 and ENO2 was much stronger by the virulence-defective mutants demonstrating that plasmid- and/or flagellin of *Salmonella* may influence host cell metabolism and regeneration.
Supported by the EU FP6 NoE MedVetNet and FP7 PROMISE. Ama Szmolka is a holder of János Bolyai Research Scholarship of HAS. A. Imre's present address is: CEVA—Phylaxia, Budapest, Hungary.

## GROWTH AND FE(III)-REDUCTION OF *SHEWANELLA XIAMENIENSIS* IN SOME CARBOHYDRATES

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Bioelectricity can be generated directly from wastewater using a microbial fuel cell (MFC) while reducing the quantity of organic materials. While some members of the genus *Shewanella* are